# ENVIRONMENTAL ASSESSMENT
Case File No.AA-008426
AK-040-02-EA-037

Applicant: Aurora Gas, LLC

Type of Action: On-shore Drilling and Production of a Natural Gas Well

Location: Nicolai Creek Well #8
T. 11 N., R. 12 W., Section 29, Seward Meridian

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Date: November 20, 2002

## I. INTRODUCTION

Aurora Gas, LLC has submitted to the Bureau of Land Management (BLM) an Application for a Permit to Drill (APD) a natural gas well. The location of the well is approximately 11 miles Southwest of the village of Tyonek in the Nicolai gas field. The Nicolai Creek No. 8 gas well will be drilled vertically into the underlying Nicolai Creek Unit (NCU), estimated to contain up to eight billion cubic feet of proven reserves.

A. Purpose and Need for the Proposed Action:
Aurora Gas, LLC will be drilling into a Federally managed subsurface lease to economically produce natural gas wells in the Nicolai Creek Unit. The proposed well is one of many Aurora Gas intends to drill and develop in the Nicolai Creek Unit over the next five years.

B. Conformance With Land Use Plan:
Activities scheduled to occur in the NCU are in conformance with the Southcentral Management Framework Plan (MFP), 1980.

## II. PROPOSED ACTION AND ALTERNATIVE

A. Proposed Action:
Aurora Gas, LLC intends to drill a natural gas well in the NCU, T. 11 N., R. 12 W., Section 29, Seward Meridian. (See attached map.) The well will physically be located 11 miles southwest of the Tyonek Village. The NCU Well #8 will be drilled vertically into the underlying natural gas reservoir, located onshore within the NCU. NCU Well #8 will be drilled off of the west end of the Shirleyville Airstrip from an existing gravel pad, constructed in 1960 by Texaco when wells #1A, #2 and #6 were drilled. Bottom Hole Location (BHL) will be at 2,500', directly below the wellhead's surface location. NCU Well #8 would vary in distance between 20 and 50 feet from existing NCU wells #6, #1A and #2 and will be drilled from a preexisting, cleared gravel pad. Access to the site can be gained by first flying into one of three landing strips at Beluga, Tyonek or Shirleyville. After that, the remaining distance to the site can be traveled via existing gravel roads. Off-road travel or the construction of additional roads will not be necessary. Equipment will be brought to the site via barge from Kenai or by air. Freight delivered by barge will be transported from the OSK dock in Nikiski and brought to the old "Timber Camp" outside the village of Tyonek. From there, it will either be hauled or driven to the site on a preexisting gravel road. Water used during operations will be hauled in by truck from a nearby well (NCU Well #3), already in production on a State lease. This water is a by-product of gas production operations from NCU Well #3. No other water sources are required. Well cuttings and fluid wastes will be collected and stored in bermed tanks on-site by Envirotech until the time of off-site disposal. Wastes will then be transported off-site (via vac trucks) and stored at the Envirotech facility, where they will be processed and disposed. Disposal consists of adding chemicals to the

post production mud chips, along with cement to make the drilling waste inert. Once processed, the inert mixture will be added to a containment cell in two foot lifts. Interstitial gravels will be added to the cell every two feet for aeration purposes.

Aurora recently tested its NCU Well #3, just north of the proposed NCU Well #8, and flow rates were greater than four million cubic feet of natural gas per day. Aurora believes that NCU Well #8 will produce similar results. Aurora Gas expects to become a major producer of natural gas in the Cook Inlet area within the next five years. Drilling of additional wells in the future will depend on the performance of wells drilled and developed in 2002.

B. No Action Alternative:

Aurora Gas, LLC would not drill its #8 Well in the NCU. No further disturbance, construction or activity would take place on the proposed NCU Well #8 pad.

## III. AFFECTED ENVIRONMENT

A. Critical Elements

The following critical elements of the human environment are either not present or would not be affected by the Proposed Action or No Action Alternative:

Areas of Critical Environmental Concern
Cultural Resources
Environmental Justice
Farmlands (Prime or Unique)
Floodplains
Invasive, Non-native Species
Native American Religious Concerns
Subsistence
Threatened or Endangered Species
Wastes, Hazardous/Solid
Wild and Scenic Rivers
Wilderness

1. Air Quality:

No air quality data is available for the NCU Well #8 site. However, air quality for the Cook inlet and Kenai Peninsula area is generally considered good.

Most of the land in the Kenai Peninsula Borough is classified by the Alaska Department of Environmental Conservation (ADEC) as Class II air sheds. Class II air sheds are generally pollution free and allow some industrial development.

2. Water Quality (Surface/Ground):

Drainage of the lowlands for this area is generally to the east. Surface water of the wetlands have low turbidity and are often brownish in color. This brownish or “tea colored” water is attributed to the staining by

organic compounds and to high iron content. This staining is natural and not associated with oil and gas activities. Generally, surface and ground water quality are considered good.

3. Wetlands/Riparian Zones:

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory maps of the area identify two types of wetlands along the road corridor. These are generally described as persistent saturated scrub bog and persistent semipermanent flooded scrub bog. An aerial survey of wetlands in June 1999 by Forcenergy and two environmental consultant staff revealed two additional wetland areas consisting of dwarf birch, alder and spruce. These are described as intermittent wetlands, with general drainage from east to west.

The proposed NCU Well #8 will be drilled in an area of open to closed white and/or black spruce forest with scattered stands of birch and cottonwood. These forests are interspersed with wetland openings consisting of lowland sedge-moss bog meadows. Depending on forest canopy, the under story of the forested areas around the proposed well consists of varying amounts of willow and alder, dwarf birch, blueberry, cranberry, Labrador tea, crowberry, feather mosses, etc. Bluejoint grass tends to dominate open areas over a wide range of growing sites.

B. Land Status:

The land upon which the NCU Well #8 will be drilled was patented to the State of Alaska in 1967 (Patent # 50-67-0253). The U.S. retained the oil and gas rights which have been leased in oil and gas lease A034161 and committed to the NCU. The patent was issued subject to the lease and the right for lessees and/or permittees to use as much of the surface of the land as is required for their operations without compensation to the patentee for properly conducted operations. The oil and gas rights will automatically vest in the patentee if the leases are relinquished or terminated.

C. Geology, Topography and Soils:

Karlstrom (1964) describes the surficial geology in this area as Quaternary proglacial-lake-bottom sediments. These sediments underlie a terraced and channeled surface between major morainal belts. Quaternary age sediments are as much as 1,000 feet thick and overlie Tertiary rocks of the Kenai group. This group consists mostly of siltstones, fine sandstones and shales. Soil types in the area consist of glacial till, lacustrine deposits of sand and silt and glacial outwash deposits with layers of gravel and sandy gravel. Isolated peat deposits are also present. Elevations for the area generally range from sea level to a little more than 100 feet above sea level.

D. Vegetation:

The Proposed Action would occur in and around the Kenai Lowlands area on the west side of Cook Inlet. Because the Kenai Lowlands were created from complex and largely modified moraines, low rolling hills separate the nearly level wetlands of muskeg and swamp. In general, the area is poorly drained (as evidenced by the muskeg, swamp and numerous lakes) and generally free of perma-frost except for isolated lenses beneath bogs or frosted area. Dwarf shrubs usually dominate over a mat of sedges, mosses and lichen which overlies a peaty substrate.

E. Visual Resources:

Visual Resource Management (VRM) Class III is assigned to the proposed project area within the Nicolai gas field. The objective of this class is to partially retain the existing character of the landscape by allowing moderate levels of change. Management activities may attract attention but should not dominate the view of the casual observer.

Scenic quality is best described as the overall impression retained after traveling through or being within an area. Scenic quality of the NCU consists of visual resources that are fairly common to the physiographic region, Class C.

F. Wildlife:

Moose are common as successional vegetation provides plentiful browse. Other mammals known to inhabit the area include redback voles, red squirrels, muskrats, porcupines and hares (James Montgomery Consulting Engineers, 1992).

The Kenai Lowlands support many species of bird and waterfowl. The list of species includes white crowned sparrow, tree swallows, northern or black-backed woodpeckers, juncos, yellow-rumped and yellow warblers, fox sparrows, Lincoln sparrows, Savannah sparrows, least sandpipers, Whimbrels, parasitic jaegers, sandhill cranes, common loons, red-necked grebes, surf scooters, trumpeter swans, greater scaup, American widgeon, arctic terns, mallards, Boneparte's gulls, Barrow's goldeneyes, red-throated loons and red-necked phalaropes (James M. Montgomery Consulting engineers, 1992, citing a letter from Bailey, 1992; Rosenberg, 1986). Bald eagles nest in the Kenai National Wildlife Refuge. Beaver Lake has a known nest (James M. Montgomery Consulting Engineers, 1992, citing a "personal communication" from Joyce, 1992)

The forested coastal habitats provide year round habitat for black bear, moose, lynx, martin and wolves. Brown bear are found in open habitat. Migrant and resident land birds use the area's shrub and forest communities for nesting. Adjacent coastal mudflats and the intermittent shrub wetlands provide habitat for breeding and migrant shorebirds and waterfowl.

## IV. ENVIRONMENTAL CONSEQUENCES

### A. Impacts of the Proposed Action:

#### 1. Critical Elements:

a. Air Quality:
Fires, smoke, volcanic eruptions and pollutants drifting from the west can affect visibility and air quality. Air quality may be temporarily affected by dust and exhaust from other construction and operational activities.

b. Cultural Resources:
No historic properties are known for the project area. Since all activities will be performed on previously disturbed ground, no new discoveries are expected. No new ground disturbance will occur in the area of development, resulting in no adverse effects upon cultural resources.

c. Subsistence:
The Proposed Action will not occur on Federal Public Lands as defined in ANILCA Sec. 102(3), and thereby does not fall under the authority of the Federal Subsistence Board and Subsistence Management Regulations for the Harvest of Fish and Wildlife on Federal Public Lands in Alaska. The Proposed Action would not incur additional Federal surface disturbance or habitat alteration than what presently exists on the proposed site or on any ancillary facilities that are required for access and other activities. The Proposed Action will not impact the capability of the area to produce a sustainable harvest of Federal subsistence resources.

Therefore, at this time, the Proposed Action will not significantly restrict Federal subsistence uses, decrease the abundance of Federal subsistence resources, alter the distribution of Federal subsistence resources, or limit qualified Federal subsistence user access from currently existing conditions. No further analysis is necessary at this time.

d. T&E Species:
The impact of the Proposed Action and Alternative on threatened and endangered plants and animals and their habitats has been evaluated in accordance with the Endangered Species Act of 1973, as amended. Based on currently available information, the Proposed Action would not affect any threatened or endangered species or their habitats. Therefore, no consultation with the USFWS is considered necessary pursuant to Section 7 of the Act and none will be undertaken.

e. Water Quality, Surface/Ground:
Only natural gas with a small volume of water is expected to be produced from the NCU Well #8. The water will be separated and stored in tanks on the facility, periodically being transported by truck to an approved disposal well (NCU Well #5) for subsurface injection. Impacts to water quality could occur should produced water be spilled on the surface.

Although not anticipated and highly unlikely, a release of natural gas liquid and/or liquid hydrocarbons could impact surface and subsurface water quality. Natural gas liquids would rapidly evaporate and disperse into the atmosphere. Heavier liquids could penetrate the soils and enter the ground waters. Should the release pose potential fire/explosive hazards, it would be burned or ignited, consuming the fuel.

Fuel spills, oil leaks, hydraulic line breaks and similar type "spills" also have potential to impact water quality. Such spills would likely be very small in volume and contained on the well pad at the facilities. These spills would be immediately cleaned up.

2. Geology, Topography and Soils:
The total area of surficial disturbance will be negligible. NCU Well #8 will be drilled from a preexisting drilling pad. Minimal surficial disturbance will be incurred during the rigging up and drilling processes. Some minor road bed erosion will likely occur due to the increased traffic flow during production. Earthquakes of Richter magnitude 6.0 to 8.8 could occur in the area surrounding the proposed well, causing major structural damage.

3. Vegetation:
Vegetation adjacent to the pad may be adversely affected by vehicle dust. Such effects should be minor, given construction of NCU Well #8 will occur during the fall rainy season from late September/early October. Impacts to vegetation would be minimal as the project would occur on an existing gravel pad. No new vegetation clearing is expected to occur.

4. Visual Resources:
Visual resource quality may be negatively affected during the construction and drilling operations. Permanent impacts to visual resources should be minimal as surface disturbance and vegetation clearing are expected to be limited by utilizing a pre-existing gravel pad for drilling and existing roads for access.

5. Wildlife:
Motor vehicle access to the immediate area surrounding the construction activities is almost exclusively restricted to oil and gas field workers. The increase in human activity and noise around the proposed construction area may temporarily displace existing wildlife in the immediate area. Upon completion of the construction operations, traffic and human activity will be minimal and should cause minimal displacement.

However, access to the area provided by the preexisting road and airstrip will impact the big game, furbearing and waterfowl populations by potentially increasing hunting pressure in an area that would otherwise be inaccessible. The remoteness of the area may also result in the illegal taking of wildlife.

B. Impacts of the No Action Alternative:

1. Critical Elements:

a. Air Quality:
Road travel to existing wells that surround the proposed NCU Well #8 would still affect the ambient air quality. A potential for surrounding wells to emit particulate matter, methane gas, carbon dioxide, carbon monoxide and nitrous oxides into the atmosphere still exists. The possibility of that happening is slight.

b. Cultural Resources:
No disturbance of any preexisting cultural resources would occur should drilling not take place.

c. Water Quality, Surface/Ground:
No impacts to subsurface resources would occur. No impacts to surface waters or existing hydrologic conditions would be incurred.

2. Vegetation:
Spills, leaks, etc. could still occur on the airstrip and roadway near the proposed NCU Well #8 site due to traffic in and out of the surrounding well pads. Barring that, no impact would be felt to the vegetation in the area surrounding the proposed well site, should drilling not occur.

3. Visual Resources:
There will be no impact to visual resources near the proposed well site should drilling not occur.

4. Wildlife:
Impacts would be the same as under the Proposed Action due to the existence of the road and accompanying airstrip. However, wildlife in the well site area would not be subjected to the displacement impacts associated with facility construction and well installation. Vehicular travel on the road would be less, but would still occur as a result of accessing the nearby existing gas wells.

C. Cumulative Impacts:
The Proposed Action would only slightly increase cumulative impacts to the resources. The well head facilities could slightly increase air emissions, adding to those already existing. Noise levels during facility construction operations would increase over a period of approximately 30 days. After initial construction was completed, noise levels would be similar to those of existing drilling operations.

## VI. CONSULTATION AND COORDINATION

A. Persons and Agencies Consulted:
Ed Jones, the Production Manager of Aurora Gas, LLC has been consulted for technical information on the disposal of cuttings and general rig operations.

B. List of Preparers:
Debbie Blank, Botanist
Jeff Denton, Subsistence Specialist
Bill Diel, Staff Geologist
Harrison Griffin, Physical Scientist
Greg Noble, Petroleum Engineer
Donna Redding, Archaeologist
Bruce Seppi, Wildlife Biologist

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